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Journal of the Society of Arts.

FRIDAY, JANUARY 7, 1859.

PRIZE FOR AN ESSAY ON MARINE ALGÆ.

A Prize of £100 has been placed at the disposal of the Council, by Sir W. C. Trevelyan, Bart., to be awarded for "The best Essay on the Applications of the Marine Algæ and their products, as food or medicine for man and domestic animals, or for dyeing and other manufacturing purposes. Competitors must give the results of their original investigations on seaweeds; and they must prepare a series of specimens illustrative of the best modes of collecting, preserving, and preparing the several species. Mere compilations will not be admitted to competition."

The Essays, with accompanying specimens, must be sent to the Society of Arts by the 31st day of December, 1860. Each Essay to be marked "Essay on Marine Algæ," and to have a motto or distinctive mark attached, which mark must also be written on a sealed letter, containing the name and address of the author.

The letters containing the names and addresses of the authors will remain with the Society of Arts, and none will be opened except that bearing the motto or mark attached to the Essay to which the adjudicators award the Prize.

Copies of the conditions may be obtained on application to the Secretary of the Society of Arts.

EXAMINATIONS, 1859.

The following Circular has been issued by the Central Committee of the Yorkshire Union of Mechanics' Institutes :—

Yorkshire Union of Mechanics' Institutes,
Central Committee, Mechanics' Institute, Leeds,
January 1, 1859.

Dear Sir,—We request you to call the attention of your Committee to the new terms on which the smaller Institutes in connection with the Yorkshire Union will be admitted to the Examination of the Society of Arts. A communication has just been received from the Secretary of the Society, in which he says—

"Having considered all the suggestions and returns which have been received from the Institutions, the Council concluded that the best mode of dealing with the subject at the present time would be to pass the following resolution, which was unanimously agreed to, viz. :—'That at the Examinations of 1859, the Provincial Unions in union with the Society of Arts may have the privilege of introducing Candidates belonging to smaller Institutes in union with such Provincial Union, but not in direct union with the Society of Arts, provided that a fee of two shillings and sixpence be paid to the Society of Arts by the Provincial Union in respect of each Candidate so admitted, and that the privilege be not exercised in favour of any Institute that has more than 50 members, or an annual income of more than £50.'"

We have to request your particular attention to the foregoing. Should you not be in union with the Society of Arts, nor in a position to take advantage of the concession made by the Council, we take the liberty to recommend your Committee to place your Institution in connection with the Society of Arts, in order that the benefits of the Examinations may be disseminated as widely as possible.

We also suggest that you should make the Examinations known as fully as possible to the members of your Institute, and, if practicable, organise classes for the preparation of Candidates for the special subjects named in the Programme of the Examinations of the Society of Arts.

We shall be happy to give you any further information that you may require, and are,

Dear Sir,
Yours truly,
JAMES HOLE,
JAMES KITSON, Jun., } Hon. Secs.

EXAMINATIONS, 1859.—LOCAL BOARDS.

The following gentlemen have been appointed the Local Board of Examiners for the Crosby Hall Evening Classes, London :—

Rev. Thomas Hugo.
Rev. J. W. Laughlin.
Rev. M. W. Lusignan.
Rev. Charles Mackenzie.
Mr. F. Reynolds.
Rev. R. Whittington.
Mr. Samuel Medley, *Secretary.*

The following gentlemen have been appointed the Local Board of Examiners for Selby :—

Mr. Thomas Cutting, Selby.
Mr. Henry Fisher, Selby.
Rev. S. H. Hooper, Parsonage, Drax.
Mr. George Lowther, Selby.
Rev. J. D. MacGachen, Selby.
Mr. Richard Taylor, Selby.
Mr. Thomas Werrey, Selby.
Mr. John Westwood, Selby, *Secretary*

BRITISH ASSOCIATION, LEEDS, 1858.

SHIPPING STATISTICS.

◆

Woolwich Dockyard, 27th Dec. 1858.

Sir,—Misapprehension having arisen with reference to the exact purport and statistical detail of the report on "Shipping Statistics," which was publicly read by me in Section G, at the late meeting of the British Association at Leeds, in September, 1858, I beg to enclose herewith a copy of the report, in the hope that by its appearing in the pages of the Society of Arts Journal, the subject matter of the report may be correctly brought before the notice of gentlemen who are now taking an interest in the important question: "What is the best method of comparing the dynamic merits of steam ships?" I am, sir, your very obedient servant,

CHARLES ATHERTON.

P. Le Neve Foster, Esq.,
Sec. of the Society of Arts, London.

REPORT

From a Committee appointed by the British Association, to inquire into the statistics of shipping, with a view to rendering statistical record more available as data, conducive to the improvement of naval architecture as respects the adaptation of the form of ships to the requirements of sea service.

The Committee so appointed consisted of the following gentlemen:—

Admiral Moorsom.
J. Scott Russell.
J. E. McConnell.
Charles Atherton.
William Fairbairn.
James Perry.
Henry Wright.
Andrew Henderson.

The committee, on commencing their proceedings, received letters from Admiral Moorsom, Mr. John Scott Russell, and Mr. J. E. McConnell, whereby the Committee was deprived of the co-operation of those gentlemen as members of this Committee, the remaining members, however, agreed to prosecute the duties assigned to them, and William Fairbairn, Esq., F.R.S., by the unanimous desire of the Committee, undertook to conduct the proceedings as Chairman with the assistance of Henry Wright, Esq., as Honorary Secretary. The Committee now begs to explain the course of proceeding by which they hoped to promote, if not mature, the objects assigned to them by the Association.

In the first place, the Committee issued a circular, inviting statistical information as to the actual sea performances of ships (see Appendix), with a view to compiling a comprehensive statement, as to the sea performances of vessels generally, whence the Committee might be enabled to select a considerable number of vessels, of which the performances at sea may have been remarkable; and their attention being thus directed to a limited selection embracing a considerable number of vessels of practically established excellence for sea service, the Committee hoped, after making due inquiry, to be enabled to present, as respects those vessels, a statistical exposition, in tabular form, of their various elements of construction and type of build; and thus, by a system of collation and induction, to discover practically those types and elements of construction which have been found by experience most conducive to good performances at sea. In the case of steam-ships, it was purposed that the statistics of the original trials to which steamers are generally put when new, should also be collected, classified, and collated with reference to the subsequent performances of the same vessels at sea, whence it might be determined to what extent and in what respects the usual smooth-water trials of steam-ships may be indicative of the probable properties to be expected of the same ships at sea, as respects their dynamic capabilities.

The Committee are happy to say that this attempt at practically inquiring into the peculiarities of construction to which the good or bad qualities of steam-ships may be attributable, has not been wholly fruitless, for, although ship-owners, ship-builders, and marine engine manufacturers have been generally reluctant to communicate particulars whereby the dynamic merits of ships may be numerically classed and compared, the results of which classification and comparison might, if promulgated, affect the commercial value of their property, and the relative professional reputation of constructors, still, in reply to the before mentioned circular, information has been communicated, as to the performance of vessels, particularly steam-vessels, by which it appears that a great difference exists between steam-ships as respects their economic capabilities for the performance of mercantile steam transport service, leading to the conclusion that the general aggregate of steam service is performed by vessels of inferior adaptation for economic duty, and consequently at a rate of prime cost expenditure, and, therefore, ultimate charge on the public, greatly in excess of that which would be involved if all steamers were of the superior class of excellence that has been already, in certain cases, actually attained. For example: this Committee are assured, on authority which they believe to be unquestionable, that a certain vessel, the *Bremen*,* of 3440 tons displacement at the time of trial, propelled by engines working up to 1624 indicated horse-power, attained the speed of 13·15 nautical miles per hour. Now if we estimate the dynamic duty thus performed by the formula $\frac{V^3 D^{\frac{2}{3}}}{\text{Ind. h.p.}} = C$, we shall have the co-efficient,

$$C = \frac{(13{\cdot}15)^3 \times (3440)^{\frac{2}{3}}}{1624} = \frac{2274 \times 227{\cdot}88}{1624} = 319,$$

and this co-efficient of dynamic duty, resulting from the mutual relation of displacement, speed, and power, appears, from the statements which have been communicated to this Committee, nearly 50 per cent. higher than that realized by the average performance of the steam-ships of the present day. The following are the co-efficients of dynamic duty deduced by the foregoing rule from the performances of mercantile steamers of high repute, of which the trial data have been communicated to this committee, viz., 325, 294, 291, 288, 259, 248, 231, 230, and 204, and many others below 200.

This Committee, therefore, regard the *Bremen* as being a felicitous exemplification of naval architecture as respects type of form adapted for easy propulsion; and as we conceive that the promulgation of some of the constructive elements of this vessel may be of public importance, we are happy in being authorised and enabled, by Messrs. Caird and Co., of Greenock, the constructors of the ship and of the engines, to communicate to the British Association the following statistical data as to the elements of construction of the *Bremen*:—

Length between perpendiculars of stem and rudder post		318 feet.
Breadth of beam		40 ,,
Depth of hold		26 ,,
Mean draught of water at the time of trial		18ft. 6in.
Displacement (D) at trial draught		3440 tons.
Area of maximum immersed section (A) at the trial draught		606 sq. ft.
Distance of maximum section (A) measuring from the stem		159 feet.
Constructors' load draught	forw.	18 feet.
	aft.	19 ,,
Displacement at constructors' load draught		3440 tons.
Rate of ships' displacement at constructors' load draught		25 tons per inch.

Data for laying off Peake's curve of sections.	Area of immersed vertical section at the distance of ⅛ length, measuring from stem	256·5 sq. ft.
	Do. ¼ Do. Do.	486 ,,
	Do. ½ Do. Do.	606 ,,
	Do. ¾ Do. Do.	489 ,,
	Do. ⅞ Do. Do.	253·5 ,,
Data for laying off curve of Displacement.	Displacement at draught of 4′ 7½″, being ¼ load draught	300 tons.
	Displacement at draught of 9′ 3″, being ½ load draught	1165 ,,
	Displacement at draught of 13′ 10½″, being ¾ load draught	2240 ,,
	Displacement at draught of 18′ 6″, or load draught	3440 ,,

The foregoing data afford all the particulars required for the construction of Peake's curve of vertical sections, whence may be deduced the position of the vertical line passing through the centre of gravity of displacement, and also the positions of the centre of gravity of the fore and aft bodies respectively.

It will be observed, from the foregoing data of the constructive elements of the *Bremen*, that the maximum immersed section is at the middle of the length, and that the vertical sections are in such ratio to each other, with reference to their respective positions, that the curve of vertical sections will be a close approximation to a parabola.

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* The *Bremen* is referred to as being the vessel which gave the highest co-efficient of dynamic performance of any vessel which was brought before the Committee, and of which the statistical data of construction were also given in a complete form.

The ratios deducible from the foregoing particulars of constructive data, combining Peake's curve of immersed vertical sections with the curve of displacement, will give a close approximation to the type of form of the immersed hull.

The engines of the *Bremen* consist of two direct-acting inverted cylinders, 90 inches diameter and 3 feet 6 ins. stroke, fitted with expansion valves capable of working expansively to a high degree. All parts of the engines are felted and lagged with wood wherever practicable, the lower 16 feet of the funnel being surrounded by a casing forming a superheating chamber, the steam entering at the lower end, and passing off at the top into the steam pipes leading to the cylinders.

On the important question as to the extent to which the ordinary smooth-water trial of a steamer affords a criterion of the general average performance that may be expected of the vessel at sea, this Committee has not been able to obtain such an extent of returns of the comparative smooth-water trials and sea performances of the same ships as enable them fully to respond to this part of the inquiry, and they refrain from expressing any speculative opinion, because they have adopted the principle which they desire to recommend to the notice of the British Association, that shipping improvement is to be discovered by statistical record and analysis of the constructive elements of ships that have practically shown themselves to possess good sea-properties, rather than by assuming the mere theories of opinionative speculation, from whatever source such opinions may emanate; in short, that experience of actual performances at sea, statistically recorded and utilized by being made the basis of comparison, is the most reliable base on which to construct an inductive system of progressive improvement in naval architecture and marine-engine construction. This Committee, however, have much satisfaction in being enabled to commence this inquiry by recording the sea performance of the before-mentioned vessel *Bremen*, on a passage from Bremen haven to New York and back, during the months of June and July last, during the whole of which passages indicator cards were frequently taken, and the indicated working power of the engines ascertained. On the out passage the mean displacement was 2,878 tons, the mean indicated horsepower was 1,078, and the mean speed 10·28 knots per hour, giving a co-efficient by the formula referred to = 204; but on the return passage the mean displacement was 2,990, the mean indicated horse-power 1,010, and the mean speed at the rate of 11·92 knots per hour, giving a co-efficient = 348. Hence, the mean co-efficient of the out and home passage = 276, being about 13 per cent. below the co-efficient (319) obtained on the smooth-water test-trial of the ship. The state of the weather and the sea was also recorded daily; it appears to have been adverse on the out passage, but favourable on the home passage. The Committee are, therefore, of opinion, that by following up this course of statistical record of the smooth-water trial and subsequent sea performances of ships respectively, a tabular statement might be compiled, showing the probable ratios of the co-efficients of smooth water and sea performance, corresponding to the various rates of speed for which steamers may be respectively powered, whence the smooth water test-trials of ships may be made available as approximately indicative of the sea service capabilities of ships as respects their dynamic properties.

Such are the statistical data of the constructive elements and dynamic capabilities of the *Bremen*, and if all steam-vessels engaged in the mercantile transport service of Britain were equally effective as respects the mutual relations of displacement, speed, and power, that is, capable of producing a co-efficient of dynamic capability = 319, by the formula referred to, it is probable that the prime cost expenses of steam-ship transport per ton weight of cargo conveyed on long passages would, on the aggregate of the foreign trade of Britain, be reduced not less than 25 per cent. as compared with the prime cost expenses incurred by steam-vessels of the average dynamic capability in present use.

The effect of improved type of build on the economy of steam transport per ton weight of goods conveyed, is such as shows the inquiry to be of vital importance in connection with the management of steam shipping affairs.

The public importance of improved type of build in a national point of view (for it is the public and not the shipowners who ultimately bear the brunt of expensive transport service), may be judged of from the statistical fact published by the Board of Trade, that no less than 899 steam-vessels (of which 511 are sea-going ships) were employed on the commercial transport service of Britain in 1857. The ratio in which the transport service of the country is performed by the aid of steam appears to be constantly on the increase, and as it is to be expected that mercantile competition will always cause the cost of freight on the general aggregate of the trade of the country to be proportionally ruled by the prime cost expenses that may be actually incurred in doing the work, it appears manifest that the public economy dependent on the general realization of shipping improvement, is a consideration that involves public interest to the extent of millions sterling per annum.

To demonstrate the vast importance of this subject, the tables in the Appendix have been compiled from the returns of the Board of Trade, to show the amount of trade between the United Kingdom and foreign countries during the year 1855. This compilation shows that the tons weight of cargo actually carried in the foreign trade of the United Kingdom in the year 1855 amounted to—

Imports	6,254,259 tons.
Exports	8,370,363 „
Total	14,624,622 „

Nearly 15 millions of tons weight of sea-borne cargo conveyed at probably 25 per cent. extra cost beyond what would be incurred if ships of the high order of dynamic merit exemplified by the *Bremen* were only and exclusively employed.

By aid of the Appendix, showing the amount of trade between Great Britain and all foreign countries respectively, parties conversant with shipping affairs will be enabled to estimate approximately the gross amount annually involved in the goods transport service of Britain. Thus public interests require that the statistical records of shipping should embrace such data as will be availably conducive to shipping improvement, by affording the means of approximately estimating the dynamic capabilities of ships, whereby every ship-constructor and ship-owner, and the directors of steam shipping companies, may be enabled to test the dynamic merits and condition of their ships respectively, a system which would gradually lead to the adoption of such types only as develop a high order of dynamic duty, and would obviate some of the most serious hazards to which private and public interests are now exposed from vessels being employed on commercial and postal services for which they are not fit.

Only let it be publicly known, as exemplified by the *Bremen*, that steam ships and their machinery may be so constructed, that on being subjected to a test-trial, the cube of the speed in knots, multiplied by the square of the cube root of the displacement, and divided by the indicated horse-power, ought, in the present day, irrespective of future improvement, to produce a quotient or co-efficient of dynamic duty equal to the number 319, and that the co-efficient deduced from the rule thus enunciated constitutes (*cœteris paribus*) a criterion of the cost price at which steam ships perform their work, and we shall then soon find that this test of dynamic merit, or the numeral co-efficient deduced therefrom, will enter into the calculation of the pecuniary value of steamers to such an extent, that ships of a low order of dynamic capability will not be built because they will not sell.

The test of dynamic merit, as above set forth, based on the mutual relations of displacement, speed, and power, presumes on the net power effectively applied in propelling the ship being always in a constant and known ratio to the gross indicated power.

The inquiry, therefore, so far, is of such a nature as demands professional knowledge and skill in order to determine and discriminate between the merit that may be due respectively to the type of form of the hull, and to the construction of the engines, propeller, and boilers; for a good type of hull, propelled by an inferior construction of machinery and boilers, or an inferior type of hull propelled by a good construction of machinery and boilers may, by the above formula, produce equal results. This Committee, however, considers it of vital importance to the promotion of the objects of this inquiry, viz., "the maturing of a system of statistical record conducive to the improvement of naval architecture," that the owners and charterers of ships, and the directors of shipping companies or agents by whom shipping affairs are conducted, should themselves have the means of ascertaining the relative dynamic merits and working condition of their ships without any reference whatever to the professional assistance of builders or engineers, but be enabled to judge for themselves whether the performance be good or bad by reference to the data afforded by their counting-house records; and this desirable object may be at once effected by the displacement of the ship being known, and by substituting in the foregoing formula the consumption of fuel in a given time (say the weight in cwts. (W) consumed per hour), in lieu of the expression for power, and regarding the hull, machinery, and boilers collectively as an integral equipment of which the co-efficient derived from the formula $\frac{V^3 \times D^{\frac{2}{3}}}{W}$ indicates the dynamic condition with reference to the dynamic condition of other vessels tested by the same rule, viz., multiply the cube of the speed by the square of the cube root of the mean displacement, and divide the product by the consumption of fuel per hour expressed in cwts. The quotient indicates the relative dynamic condition of the vessel. For example: A steam-ship (A) performed out and home voyages amounting to 7,200 nautical miles in 652 hours, being at the average speed of 11·04 knots per hour, the consumption of coal was 1,519 tons or 30,380 cwts., being at the rate of 47 cwts. per hour, and the mean displacement was 2,934 tons. Hence the co-efficient of dynamic duty indicative of the merits of the performance on this occasion is—

$$\frac{(11{\cdot}04)^3 \times (2934)^{\frac{2}{3}}}{47} = \frac{1345{\cdot}6 \times 205}{47} = 5870.$$

Again, another vessel (B), with a mean displacement of 840 tons, attains on long-continued service the average speed of 12·78 knots per hour, with the average consumption of 50·3 cwts. coal per hour, giving a co-efficient of dynamic duty $\frac{(12{\cdot}78)^3 \times (840)^{\frac{2}{3}}}{50{\cdot}3} = \frac{2087{\cdot}3 \times 89}{50{\cdot}3} = 3693.$ Thus, in one case (A) the co-efficient of dynamic duty, based on the consumption of fuel, is 5870, whilst in the other case (B) it is only 3693; that is, one cwt. of coal in A performs as much dynamically effective work as is performed by $1\frac{6}{10}$ cwts. in the case of B, a discrepancy which may well induce professional inquiry being instituted by the shipowner, whether the inferior performance of B is occasioned by inferior type of form, or foulness of bottom, or inferior principle of mechanical appliances, or inferior management, or bad coal; for these causes combined, or indeed either one of them alone, may be sufficient to account for the result.

Now, what are the all-important elements of construction thus proposed to be embraced in public records, and thereby made known to the purchasers and charterers of ships with a view to enable such parties to test the economic working capabilities of ships, so conducive to the reformation above referred to? Why, by the rule above enunciated, the displacement corresponding to the constructor's load draught at which the ship may be tried, and to which approximately, as a general rule, the ship may be loaded, becomes the only item of statistical data that requires to be officially recorded, for the test trial and sea performances of ships, as above shown will give the capabilities for speed; and the consumption of fuel per hour corresponding thereto will be known from the counting-house ledger.

It is, therefore, suggested that the registration records of every ship give the displacement when the ship is immersed down to some definite line, which may be denominated the constructor's load line.

The assignment of the constructor's load line draught forward and aft, and the corresponding displacement, are all the statistical data that are required to be registered in addition to the details of registration already enforced under the Merchant Shipping Act of 1854, in order to determine the comparative co-efficients, and put the system of practical rivalry hereby suggested into operation, as being the most effective system for inducing improvement in naval architecture.

As regards the existing system of shipping statistics and shipping registration, with reference to its affording data available for promoting shipping improvement, this Committee has to observe that, although the aggregate register tonnage of mercantile shipping appears to be a very close approximation to the aggregate weight-carrying capability of the entire mercantile navy, still, when considered in detail with reference to particular ships, it is found that the register tonnage of a ship affords no approximate criterion whatever either of the load displacement or of the weight-carrying capabilities of ships respectively, for, by reference to the Appendix, it will be found that ships are frequently loaded with dead weight of cargo to the extent of double their register tonnage, and the statement given below shows the following extreme cases of weight-carrying capability with reference to register tonnage:—

Country traded with.	Vessels.	Weight of Cargo.	Register Tonnage.	Ratio of Cargo to Tonnage.
		Tons.		
Morocco	34	11,576	4,075	2·8 to 1
Tunis	1	780	259	3 to 1
Bolivia	2	2,391	455	5·2 to 1

These cases appeared so remarkable that the Committee were anxious to prosecute inquiries with reference to the build and sea performances of those particular ships, and with that view they addressed a letter to the Custom House for the purpose of identifying the vessels thus referred to; but the official fees demanded for responding to such inquiries, put it out of the power of the Committee to avail themselves to any useful purpose of the shipping statistics of Government.

Another difficulty which greatly obstructs the collecting of statistics on the sea performances of mercantile shipping, is the great number of vessels bearing the same name. In many cases, there are scores of vessels bearing the same name, thus rendering it extremely difficult to trace and scrutinize the performance of a vessel of any name with certainty as to her identity; for, in publishing the arrivals and departures of shipping in mercantile navy records, the registered number of a ship, which constitutes the only means of identification, is not generally given in connection with her name.

A further instance of the insufficiency of our present system of shipping registration as statistical data indicative of the size of the hull of steam shipping, is afforded by the statement given in the Appendix, which has been deduced from a Return of the House of Commons, showing the per centage deduction from the gross tonnage allowed for the engine rooms of steam-ships, whence we see that, without any reference whatever being made to the actual weight of the machinery, deductions are made from the gross tonnage varying from 5 per cent. to 92 per cent. of the gross measurement, the remainder only being brought to account as the registered tonnage of the ship.

In conclusion, this Committee begs to observe, that if the views thus brought before the notice of the British Association should be deemed worthy of further prosecution, and be favourably entertained by the Government, the statistics of the Post-office, as respects the constructive elements, and test-trials, and subsequent sea performances of the various steam-ships employed in H.M. Mail Service, would afford a collection of statistical data which, if duly analysed and applied as herein suggested, would greatly promote the objects of this inquiry which the British Association has thus been pleased to institute.

The Committee has the painful duty of announcing the death of one of its members, James Perry, Esq., whose personal character, practical intelligence, and public usefulness, were of such an order, that his decease may be mourned as a public loss.

(Signed)
WILLIAM FAIRBAIRN, Chairman.
CHARLES ATHERTON.
ANDREW HENDERSON.
HENRY WRIGHT.

APPENDIX.

TO SHIPPING COMPANIES, SHIPOWNERS, AND OTHERS CONNECTED WITH THE MERCANTILE MANAGEMENT AND DIRECTION OF SHIPS.

COMMITTEE ON SHIPPING STATISTICS.

11, Buckingham-street, Adelphi, London, W.C.,
26th April, 1858.

GENTLEMEN,—The attention of the British Association at their late meeting in Dublin having been directed to the consideration of shipping statistics, the Committee of the Association came to the resolution "that the application of science to the improvement of steam-ships has been impeded by the difficulty of obtaining the necessary data from the present registration;" a Committee was thereupon appointed to inquire into this subject, which Committee beg the favour of your assistance, with a view to ascertain, from the general experience and records of shipping companies, shipowners, and others connected with the mercantile management and direction of shipping, what description of vessels has produced the best results.

In the prosecution of this inquiry, the Committee desire now, in the first place, to ascertain what have been the actual sea performances of ships, and their attention being thus directed to instances in which the performance of particular ships has been remarkable, further steps will hereafter be taken to inquire into the circumstances of such cases, and ascertain the peculiarities of proportion and type of form of the vessels which have produced such results.

With these objects in view, the Committee request the favour of your filling up the annexed form, giving an example of the quickest voyage made by each of the vessels of the line of packets under your direction, on the passage or station on which such vessels respectively may have been employed.

I am, Gentlemen,
Your very obedient servant,
HENRY WRIGHT, Hon. Sec.
By Order of the Committee.

N.B.—The Committee will feel obliged by your returning the form, when filled up, to the above address, as soon as convenient, not later than 1st of June.

SHIPPING COMMITTEE.
OFFICE—11, BUCKINGHAM-STREET, LONDON, W.C. } *It is requested that this* FORM *be filled up and returned by the* 1*st of June*, 1858.

Name of Vessel and Registered Number.	Description of Vessel; whether Steamer or Sailing Vessel, and her Rig.	Passage referred to as an example of the performance of the Ship.			Load Draught.	Length of Vessel, as usually measured for Builders' Tonnage.	Outside Breadth of Vessel, as measured for Builders' Tonnage.	Depth of Hold.	Builders' Tonnage.	Register Tonnage.	Registered H.P.	Coals consumed on voyage, if a Steamer.	NOTE.—In addition to the foregoing particulars, it is requested that the Displacement of the Vessels be given at the following Draughts, if known.					
		Port of Departure, and Date of Departure.	Port of Arrival, and Date of Arrival.	Detention on voyage by stoppage at intermediate Ports, or Becalmed.									When Launched.		When ready for Cargo.		When immersed to Constructor's Load-line.	
													Draught.	Displacement.	Draught.	Displacement.	Draught.	Displacement.
				Dys. Hrs.	Ft. In.	Ft. In.	Ft. In.	Ft. In.				Tns. Cwts.	Ft. In.	Tons.	Ft. In.	Tons.	Ft. In.	Tons.

*Signature*____________________
*Address*____________________

APPENDIX.

Table showing the difference which exists between the "Register Tonnage" of Vessels and the "Tons Weight" of Cargo actually carried in the Trade and Navigation of the United Kingdom with Foreign Countries and British Possessions in 1852, '53, '54, and '55, deduced from Returns of the Board of Trade.

		IMPORTS.					EXPORTS.				
Name of Country.	Date.	No. of Vessels.	Register Tonnage.	Tons Weight of Cargo Carried.	Difference of Cargo, with reference to Tonnage.	Per Centage of Difference.	No. of Vessels.	Register Tonnage.	Tons Weight of Cargo Carried.	Difference of Cargo, with reference to Tonnage.	Per Centage of Difference.
NORTHERN RUSSIA	1852	2022	410,875	452,291	+41,416	+10	1690	343,459	280,856	−62,603	−18
	1853	3006	581,713	709,390	+127,677	+22	2291	458,811	314,930	−143,881	−31
	1854	434	72,772	89,174	+16,898	+23	243	36,947	2,735	−34,212	−92
	1855	...	...	1,174	...	...	...	...	...	...	...
SOUTHERN RUSSIA	1852	599	184,020	161,206	−22,814	−12	117	35,280	21,788	−13,492	−38
	1853	692	207,305	185,593	−21,712	−10	174	50,261	14,810	−35,451	−75
	1854	422	121,761	111,074	−10,687	−8	32	10,200	4,486	−5,714	−56
	1855	...	...	22,143	...	...	...	...	...	...	...
CRIMEA	1855	80	27,906	905	−27,001	−96	358	146,377	56,230	−90,147	−61*
SWEDEN	1852	1013	195,819	308,355	+112,536	+57	781	142,981	82,928	−60,053	−42
	1853	1352	256,579	399,836	+143,257	+51	1087	187,905	90,630	−97,275	−51
	1854	1530	278,489	440,940	+162,451	+58	1113	194,296	113,199	−81,097	−41
	1855	1551	316,568	467,160	+140,592	+44	1052	194,870	127,919	−66,951	−34
NORWAY	1852	1391	216,027	218,524	+2,497	+1	1435	232,601	70,598	−162,003	−69
	1853	1888	301,717	313,158	+11,441	+3	1991	315,990	80,288	−235,702	−74
	1854	1917	299,197	314,717	+15,520	+5	2201	352,466	104,334	−248,132	−70
	1855	1585	285,402	240,124	−45,278	−15	1676	273,857	118,206	−155,651	−56
DENMARK	1852	2112	195,198	183,588	−11,610	−5	1305	464,131	401,578	−62,553	−13
	1853	2324	214,742	232,301	+17,559	+8	5477	619,433	411,312	−208,121	−33
	1854	2286	202,462	223,402	+20,940	+10	5364	617,384	495,858	−121,526	−19
	1855	2373	229,753	247,792	+18,039	+7	4680	545,478	512,702	−22,776	−4
PRUSSIA	1852	1972	299,493	409,504	+110,011	+36	1833	298,814	334,465	+35,651	+11
	1853	3542	573,687	776,656	+202,969	+35	2535	441,379	399,223	−42,156	−9
	1854	3145	540,130	682,654	+142,524	+26	2425	437,724	446,529	+8,805	+2
	1855	2907	544,268	640,960	+96,692	+17	2441	451,779	521,422	+69,643	+15
MECKLENBURG	1852	234	25,207	29,629	+4,422	+17	132	18,778	19,062	+284	+1
	1853	266	32,869	34,536	+1,667	+5	188	29,106	32,742	+3,636	+12
	1854	210	27,569	27,854	+285	+1	149	21,784	23,381	+1,597	+7
	1855	203	27,693	36,569	+8,876	+32	176	27,763	37,487	+9,724	+35
HANOVER	1852	767	51,180	31,375	−19,805	−38	691	47,936	62,193	+14,257	+29
	1853	644	42,599	35,415	−7,184	−16	707	52,248	65,867	+13,619	+26
	1854	669	45,003	37,636	−7,367	−16	774	54,601	64,722	+10,121	+18
	1855	742	58,000	36,753	−21,247	−36	851	64,681	87,936	+23,255	+36
OLDENBURG	1852	223	13,261	8,737	−4,524	−34	172	9,638	14,486	+4,848	+50
	1853	153	10,196	5,183	−5,013	−49	133	9,545	12,141	+2,596	+27
	1854	144	9,568	9,211	−357	−3	129	9,073	11,601	+2,528	+27
	1855	202	19,732	10,684	−9,048	−45	154	14,437	19,186	+4,749	+32
HANSE TOWNS	1852	2494	502,819	79,592	−423,227	−84	2736	513,814	493,096	−20,718	−4
	1853	2401	475,335	115,729	−359,606	−75	2636	489,934	484,233	−5,701	−1
	1854	2493	519,720	165,007	−354,713	−68	2719	543,989	502,330	−41,659	−7
	1855	2810	627,127	125,279	−501,848	−80	2815	563,686	607,497	+43,811	+7
HOLLAND	1852	3454	617,152	141,681	−475,471	−77	2669	417,052	321,758	−95,294	−24
	1853	3113	644,091	147,552	−496,539	−77	2315	380,306	283,222	−97,084	−25
	1854	3298	621,322	190,789	−430,533	−69	2749	440,659	364,419	−76,240	−17
	1855	4127	717,955	155,634	−562,321	−78	2950	503,156	434,240	−68,916	−13
JAVA AND SUMATRA	1852	10	4,218	4,610	+392	+9	43	19,914	14,873	−5,041	−25
	1853	12	4,969	6,483	+1,514	+30	36	18,699	15,576	−3,123	−16
	1854	24	10,436	11,467	+1,031	+9	34	15,494	11,417	−4,077	−26
	1855	10	5,163	7,957	+2,794	+54	42	20,301	12,674	−7,627	−37

* Not including Transports and munitions of war.

APPENDIX (CONTINUED.)

IMPORTS.							EXPORTS.				
Name of Country.	Date.	No. of Vessels.	Register Tonnage.	Tons Weight of Cargo carried.	Difference of Cargo, with reference to Tonnage.	Per Centage of Difference.	No. of Vessels.	Register Tonnage.	Tons Weight of Cargo carried.	Difference of Cargo with reference to Tonnage.	Per Centage of Difference.
BELGIUM	1852	1265	222,375	40,319	−182,056	−81	920	154,810	98,333	− 56,477	−36
	1853	1241	226,156	44,177	−181,079	−80	882	155,586	112,680	− 42,906	−27
	1854	1338	236,508	77,632	−158,976	−67	912	169,996	130,891	− 39,105	−23
	1855	1544	274,031	51,826	−222,205	−81	1084	179,692	112,955	− 66,737	−37
FRANCE	1852	7867	851,128	232,969	−618,159	−75	7478	838,628	719,283	−119,345	−14
	1853	8884	1,014,334	249,541	−764,793	−75	8218	920,783	812,468	−108,315	−11
	1854	8728	1,018,298	147,632	−870,666	−85	8185	989,093	931,930	− 57,163	− 5
	1855	9776	1,250,343	135,298	−1115045	−89	9569	1,172,065	1,211,385	+ 39,320	+ 3
ALGERIA	1852	7	779	1,194	+ 415	+53	76	13,905	16,939	+ 3,034	+21
	1853	29	3,723	6,276	+ 2,553	+68	112	19,374	26,298	+ 6,924	+35
	1854	38	6,065	9,403	+ 3,338	+55	194	25,527	24,190	− 1,337	− 5
	1855	19	3,645	1,695	− 1,950	−53	140	23,224	30,592	+ 7,368	+31
ISLE OF BOURBON	1852	...	...	...	...	...	...	...	...	...	...
	1853	...	...	...	...	...	...	...	...	...	...
	1854	1	220	230	+ 10	+ 4	2	632	657	+ 25	+ 4
	1855	...	...	...	...	...	5	1,398	154	− 1,244	−88
PORTUGAL, AZORES, MADEIRA	1852	838	82,371	68,728	− 13,643	−16	1029	127,767	73,584	− 54,183	−41
	1853	815	94,886	95,127	+ 241	+ 2	1197	171,299	126,631	− 44,668	−26
	1854	1023	116,842	120,501	+ 3,659	+ 3	1046	150,527	103,522	− 47,005	−31
	1855	886	110,211	118,822	+ 8,611	+ 7	920	127,988	104,029	− 23,959	−18
CAPE VERD ISLANDS	1852	3	496	678	+ 182	+36	56	12,871	8,886	− 3,985	−30
	1853	2	278	411	+ 133	+47	58	14,222	16,802	+ 2,580	+18
	1854	3	464	677	+ 213	+43	63	14,175	14,503	+ 328	+ 2
	1855	1	139	195	+ 56	+40	35	8,607	10,321	+ 1,714	+19
SPAIN AND CANARIES	1852	655	75,342	54,497	− 20,845	−27	1445	263,516	250,087	− 13,429	− 5
	1853	781	90,561	80,469	− 10,092	−11	1709	294,001	294,087	+ 86	+·03
	1854	1047	125,443	105.113	− 20,330	−16	1663	259,961	265,850	+ 5,889	+ 2
	1855	1372	179,030	150,837	− 28,193	−15	1387	239,519	239,491	− 28	−·01
CUBA AND PORTO RICO	1852	199	60,363	57,284	− 3,079	− 5	245	70,768	63,680	− 7,088	−10
	1853	329	87,398	95,557	+ 8,159	+ 9	297	85,161	81,717	− 3,444	− 4
	1854	488	144,393	162,313	+ 17,920	+12	297	84,575	76,023	− 8,552	−10
	1855	317	100,137	110,772	+ 10,635	+10	380	119,885	116,003	− 3,882	− 3
PHILLIPPINE ISLANDS	1852	9	4,823	6,079	+ 1,256	+26	10	5,178	6,833	+ 1,655	+31
	1853	6	3,324	3,719	+ 395	+11	15	7,024	9,100	+ 2,076	+29
	1854	27	14,267	21,692	+ 7,425	+52	9	4,797	4,217	− 580	−12
	1855	31	17,785	22,158	+ 4,373	+24	11	5,873	4,562	− 1,311	−22
FERNANDO PO	1852	...	...	2,010	...	...	...	...	6,968	...	...
	1853	...	...	5,488	...	...	...	...	9,502	...	...
	1854	14	6,820	5,230	− 1,590	−23	20	7,614	5,073	− 2,541	−33
	1855	16	6,824	6,679	− 145	− 2	17	6,759	5,234	− 1,525	−22
SARDINIA	1852	53	14,068	2,181	− 11,887	−84	303	65,186	73,477	+ 8,291	+12
	1853	51	15,863	2,501	− 13,362	−84	437	96,399	112,246	+ 15,847	+16
	1854	180	48,528	3,497	− 45,031	−92	467	102,491	118,429	+ 15,938	+15
	1855	105	32,085	11,157	− 20,928	−65	320	97,027	112,352	+ 15,325	+15
TUSCANY	1852	110	18,483	17,706	− 777	− 4	99	19,260	23,592	+ 4,332	+22
	1853	139	24,776	25,645	+ 869	+ 3	124	21,695	28,154	+ 6,459	+29
	1854	172	30,672	26,141	− 4,531	−14	119	19,881	25,074	+ 5,193	+26
	1855	206	37,897	28,805	− 9,092	−24	87	13,676	20,687	+ 7,011	+51
PAPAL STATES	1852	43	8,157	7,383	− 774	− 9	49	8,292	9,782	+ 1,490	+18
	1853	45	7,726	10,419	+ 2,693	+34	53	9,587	11,229	+ 1,642	+17
	1854	20	3,674	2,004	− 1,670	−45	37	6,542	8,085	+ 1,543	+23
	1855	27	5,102	6,760	+ 1,658	+32	39	6,758	11,080	+ 4,322	+64
NAPLES	1852	404	54,985	69,575	+ 14,590	+26	371	64,327	70,370	+ 6,403	+ 9
	1853	371	55,079	72,822	+ 17,743	+32	359	64,695	72,326	+ 7,631	+11
	1854	509	81,729	104,809	+ 23,080	+28	360	63,181	72,531	+ 9,350	+14
	1855	411	71,987	82,006	+ 10,019	+13	404	73,422	93,194	+ 19,772	+27
AUSTRIA	1852	117	28,900	28,439	− 461	− 1	357	95,529	97,744	+ 2,215	+ 2
	1853	147	34,070	30,238	3,832	−11	344	83,463	86,115	+ 2,652	+ 3
	1854	178	48,396	28,774	− 19,622	−40	308	76,034	94,127	+ 18,093	+23
	1855	164	45,126	42,495	− 2,631	− 5	193	65,877	78,813	+ 12,936	+19
GREECE	1852	53	7,470	6,707	− 763	−10	78	17,021	10,014	− 7,007	−41
	1853	91	15,120	11,368	− 3,752	−24	86	21,425	12,263	− 9,162	−42
	1854	58	9,361	7,055	− 2,306	−24	101	22,679	29,605	+ 6,926	+30
	1855	178	39,919	41,901	+ 1,982	+ 4	78	22,716	34,658	+ 11,942	+52
TURKEY	1852	335	76,098	73,816	− 2,282	− 3	566	146,976	94,825	− 52,151	−35
	1853	600	155,973	184,952	+ 28,979	+18	876	237,860	102,836	−135,024	−56
	1854	429	123,444	104,893	− 18,551	−15	1038	356,558	301,580	− 44,978	−12
	1855	439	131,336	84,453	− 46,883	−35	1718	559,295	541,417	− 17,878	−

APPENDIX (Continued.)

Name of Country.	Date.	IMPORTS.					EXPORTS.				
		No. of Vessels.	Register Tonnage.	Tons Weight of Cargo Carried.	Difference of Cargo, with reference to Tonnage.	Per Centage of Difference.	No. of Vessels.	Register Tonnage.	Tons Weight of Cargo Carried.	Difference of Cargo, with reference to Tonnage.	Per Centage of Difference.
WALLACHIA AND MOLDAVIA	1852	565	105,942	143,385	+ 37,443	+35	157	25,669	14,878	− 10,791	−42
	1853	557	97,706	133,849	+ 36,143	+37	123	19,047	8,301	− 10,746	−56
	1854	142	21,715	29,872	+ 8,157	+37	6	666	1,017	+ 351	+52
	1855	11	2,683	4,642	+ 1,959	+73	5	606	590	− 16	− 2
SYRIA AND PALESTINE............	1852	27	5,408	5,599	+ 191	+ 3	71	14,600	8,038	− 6,562	−45
	1853	45	9,491	11,223	+ 1,732	+18	51	10,997	9,730	− 1,267	−11
	1854	21	4,693	4,896	+ 203	+ 4	42	9,601	9,226	− 375	− 3
	1855	24	5,445	3,119	− 2,326	−42	90	20,046	16,726	− 3,320	−16
EGYPT	1852	557	174,400	179,860	+ 5,460	+ 3	257	79,359	63,679	− 15,680	−19
	1853	451	152,936	156,694	+ 3,758	+ 2	170	71,237	31,412	− 39,825	−55
	1854	400	133,053	141,458	+ 8,405	+ 6	258	94,208	77,868	− 16,340	−17
	1855	468	153,418	175,043	+ 21,625	+14	191	72,196	58,057	− 14,139	−19
TRIPOLI...	1852	...	...	...	...	...	...	...	...	...	...
	1853	...	...	...	...	...	...	...	...	...	...
	1854	...	...	13	...	...	...	...	...	...	...
	1855	...	...	127	...	...	...	...	...	...	...
TUNIS	1852	...	...	100	...	...	1	259	780	+ 521	+201*
	1853	...	...	106	...	...	4	728	858	+ 130	+17
	1854	1	164	226	+ 62	+37	9	1,542	1,938	+ 396	+24
	1855	2	224	...	...	...	9	1,492	2,269	+ 777	+52
MOROCCO..	1852	39	4,357	3,349	− 1,008	−23	25	3,375	1,716	− 1,659	−49
	1853	76	8,448	8,300	− 148	− 1	37	5,511	1,770	− 3,741	−67
	1854	110	12,720	14,664	+ 1,944	+15	34	4,075	11,576	+ 7,501	+184
	1855	142	16,720	19,827	+ 3,107	+19	45	5,719	4,244	− 1,475	−25
UNITED STATES	1852	1382	1,101,023	728,441	−372,582	−33	2026	1,442,076	1,193,216	−248,860	−17
	1853	1436	1,088,009	797,747	−290,262	−26	2157	1,541,278	1,347,918	−193,360	−12
	1854	1502	1,291,532	956,516	−335,016	−26	1972	1,486,551	1,225,867	−260,684	−17
	1855	1171	1,096,379	604,554	−491,826	−45	1498	1,334,237	1,021,418	−312,819	−23
MEXICO..	1852	21	13,781	6,335	− 7,446	−54	43	16,787	14,039	− 2,748	−16
	1853	24	7,406	9,438	+ 2,032	+27	50	12,724	9,821	− 2,903	−22
	1854	21	6,360	9,854	+ 3,494	+54	33	7,041	6,521	− 520	− 7
	1855	38	8,101	9,582	+ 1,481	+18	47	10,656	8,710	− 1,946	−18
CENTRAL AMERICA	1852	50	15,354	5,772	− 9,582	−62	26	9,300	2,418	− 6,882	−74
	1853	34	7,136	4,213	− 2,923	−40	13	3,075	1,938	− 2,137	−69
	1854	46	9,690	2,540	− 7,150	−73	10	4,012	1,611	− 2,401	−59
	1855	19	5,005	2,452	− 2,553	−51	17	5,342	2,586	− 2,756	−57
HAYTI..	1852	55	11,537	12,583	+ 1,046	+ 9	45	7,988	2,951	− 5,037	−63
	1853	47	10,630	12,226	+ 1,596	+15	29	4,455	1,592	− 2,863	−54
	1854	45	9,405	10,188	+ 783	+ 8	40	7,201	2,331	− 4,870	−66
	1855	31	7,163	7,654	+ 491	+ 6	30	4,987	1,493	− 3,494	−70
FOREIGN WEST INDIES............	1852	5	996	434	− 562	−56	209	65,878	55,037	− 10,841	−16
	1853	39	44,899	796	− 44,103	−98	246	101,916	71,631	− 30,285	−29
	1854	53	48,754	2,773	− 46,021	−94	249	95,217	57,961	− 37,256	−39
	1855	53	50,775	3,583	− 47,192	−92	231	96,517	56,859	− 39,658	−41
NEW GRANADA	1852	39	8,018	6,134	− 1,884	−23	80	48,105	36,742	− 11,363	−24
	1853	27	5,973	4,716	− 1,257	−21	39	13,100	17,073	+ 3,973	+30
	1854	40	9,094	9,314	+ 220	+ 2	21	6,526	6,099	− 427	− 6
	1855	42	9,614	8,979	− 635	− 6	27	6,636	6,789	+ 153	+ 2
VENEZUELA	1852	8	1,429	1,022	− 407	−28	32	5,997	3,213	− 2,784	−46
	1853	9	1,626	1,219	− 407	−25	27	5,106	2,710	− 2,396	−46
	1854	13	2,676	2,240	− 436	−16	39	6,885	3,292	− 3,592	−52
	1855	11	2,747	3,432	+ 685	+25	35	6,250	3,697	− 2,553	−40
BRAZIL	1852	247	71,578	43,623	− 27,955	−39	435	115,024	102,104	− 12,920	−11
	1823	318	88,455	63,865	− 24,590	−27	422	122,493	105,005	− 17,488	−14
	1854	273	86,077	61,858	− 24,219	−28	539	161,373	157,408	− 3,965	− 2
	1855	305	85,037	62,450	− 22,587	−26	446	144,483	127,125	− 17,358	−12
MONTE VIDEO	1852	34	6,977	7,005	+ 28	+·4	42	8,687	11,023	+ 2,336	+26
	1853	57	12,288	12,653	+ 365	+ 3	30	9,603	14,058	+ 4,455	+46
	1854	40	9,091	10,232	+ 1,141	+12	46	12,376	12,885	+ 509	+ 4
	1855	69	14,816	17,228	+ 2,412	+16	34	9,723	14,897	+ 5,174	+53
BUENOS AYRES............................	1852	124	28,047	30,033	+ 1,986	+ 7	92	20,043	15,145	− 4,898	−24
	1853	97	21,230	31,330	+ 100	+·4	67	14,890	8,705	− 6,185	−41
	1854	122	26,967	30,224	+ 3,257	+12	117	26,802	24,270	− 2,532	− 9
	1855	112	25,182	25,568	+ 386	+ 1	88	22,544	17,523	− 5,021	−22
PATAGONIA	1852	23	5,455	7,282	+ 1,827	+33	...	...	...	...	...
	1853	6	1,758	2,245	+ 487	+27	...	...	...	...	...
	1844	1	368	431	+ 63	+17	...	...	...	...	...
	1855	2	558	...	...	...	...	...	...	...	...

* *Queen of the Tyne*, sailing vessel. Registered Number, 3443.

APPENDIX (CONTINUED.)

		IMPORTS.					EXPORTS.				
Name of Country.	Date.	No. of Vessels.	Register Tonnage.	Tons Weight of Cargo carried.	Difference of Cargo, with reference to Tonnage.	Per Centage of Difference.	No. of Vessels.	Register Tonnage.	Tons Weight of Cargo carried.	Difference of Cargo, with reference to Tonnage.	Per Centage of Difference.
CHILI	1852	74	22,750	23,378	+ 620	+ 2	142	55,545	51,253	− 4,292	− 7
	1853	95	30,974	30,057	− 917	− 3	138	57,953	59,267	+ 1,314	+ 2
	1854	83	27,985	34,509	+ 6,524	+ 23	191	64,846	66,925	+ 2,079	+ 3
	1855	99	31,851	41,332	+ 9,481	+ 29	135	60,434	60,919	+ 485	+ ·8
BOLIVIA	1852	12	4,664	6,519	+ 1,855	+ 39	2	280	...	...	...
	1853	1	736	1,659	+ 923	+125*	1	199	...	...	...
	1854	...	...	834	...	...	...	...	...	...	...
	1855	2	455	2,391	+ 1,936	+425†	...	...	...	...	...
PERU	1852	166	78,384	102,236	+ 23,852	+ 30	69	34,679	35,142	+ 463	+ 1
	1853	210	103,873	125,899	+ 22,026	+ 21	71	29,062	23,313	− 5,749	− 19
	1854	378	191,044	243,934	+ 52,890	+ 27	104	60,898	32,717	− 28,181	− 46
	1855	371	219,215	274,199	+ 54,984	+ 25	89	47,410	32,300	− 15,110	− 31
ECUADOR	1852	...	...	138	...	...	2	849	47	− 802	− 94
	1853	2	565	270	− 295	52	5	1,325	373	− 952	− 71
	1854	2	464	573	+ 109	23	2	509	161	− 348	− 68
	1855	2	720	907	+ 187	26	1	261	184	− 77	− 29
CHINA (including HONG KONG)	1852	118	63,997	33,592	− 30,405	− 47	99	47,097	37,929	− 9,168	− 19
	1853	118	64,928	33,289	− 31,639	− 48	114	56,028	50,283	− 5,745	− 12
	1854	135	79,084	40,952	− 38,132	− 48	64	34,814	28,536	− 6,278	− 18
	1855	133	83,211	40,785	− 42,426	− 50	96	53,929	45,506	− 8,423	− 15
BORNEO AND INDIAN ARCHIPELAGO	1852	...	...	...	...	...	1	532	743	+ 211	+ 39
	1853	...	...	...	...	...	3	1,722	3,241	+ 1,519	+ 88
	1854	...	...	...	...	...	...	...	...	...	...
	1855	...	...	...	...	...	...	...	...	...	...
BIRMAN EMPIRE	1852	...	...	...	...	...	...	...	...	...	...
	1853	...	...	...	...	...	5	2,675	1,871	− 804	− 30
	1854	...	...	434	...	...	9	3,561	27	− 3,534	− 99
	1855	...	...	...	...	...	8	3,125	23	− 3,102	− 99
PERSIAN GULF	1852	...	...	...	...	...	1	162	...	...	...
	1853	...	...	...	...	...	2	337	209	− 128	− 35
	1854	...	...	...	...	...	...	...	...	...	...
	1855	...	...	...	...	...	...	...	...	...	...
RED SEA	1852	...	...	...	...	...	5	2,312	2,466	+ 154	+ 6
	1853	...	...	...	...	...	4	1,115	766	− 349	− 31
	1854	...	...	...	...	...	3	858	1,843	+ 985	+114
	1855	...	...	...	...	...	7	2,887	3,924	+ 1,037	+ 36
WEST COAST OF AFRICA (Foreign Possessions)	1852	108	32,073	28,752	− 3,321	− 10	101	29,137	28,679	− 458	− 1
	1853	88	25,817	25,047	− 770	− 3	153	51,618	54,171	+ 2,553	+ 5
	1854	128	36,858	33,665	− 3,193	− 8	150	46,266	52,352	+ 6,086	+ 13
	1855	116	37,296	36,011	− 1,285	− 3	148	46,813	54,727	+ 7,904	+ 17
EAST COAST OF AFRICA	1852	4	1,471	1,438	− 33	− 2	1	262	87	− 175	− 66
	1853	...	...	...	...	...	1	178	113	− 65	− 36
	1854	...	...	...	...	...	2	626	768	+ 142	+ 22
	1855	1	174	107	− 67	− 39	2	406	105	− 301	− 74
SOUTH SEA ISLANDS	1852	...	...	...	...	...	6	1,339	529	− 810	− 60
	1853	1	181	70	− 111	− 61	3	729	671	− 58	− 8
	1854	...	...	...	...	...	6	2,267	2,409	+ 142	+ 6
	1855	1	296	130	− 166	− 56	4	1,396	1,370	− 26	− 2
GREENLAND AND SOUTH SEA FISHERIES	1852	54	15,009	3,783	− 11,226	− 74	54	15,058	100	− 14,958	− 99
	1853	63	16,226	4,347	− 11,879	− 73	67	16,982	51	− 16,931	− 99
	1854	52	14,596	2,180	− 12,416	− 85	55	14,702	...	...	...
	1855	58	16,763	3,987	− 12,776	− 76	56	15,189	...	...	...
BALTIC FLEET	1854	7	5,161	...	...	...	16	15,380	...	...	...
	1855	11	2,339	...	...	...	3	647	...	...	...
ALACRANE ISLANDS	1852	...	...	...	...	...	...	...	...	...	...
	1853	...	...	...	...	...	...	...	...	...	...
	1854	...	...	...	...	...	...	...	...	...	...
	1855	1	444	...	...	...	...	...	...	...	...
ARCTIC REGIONS	1852	...	...	...	...	...	...	...	...	...	...
	1853	...	...	...	...	...	2	574	...	...	...
	1854	...	...	...	...	...	...	...	...	...	...
	1855	...	...	...	...	...	...	...	...	...	...
CHANNEL ISLANDS	1852	1821	179,607	121,999	− 57,608	− 32	1560	137,881	75,717	− 62,164	− 45
	1853	1890	176,850	131,132	− 44,618	− 25	1486	128,546	71,557	− 56,989	− 44
	1854	2083	191,688	134,508	− 57,180	− 29	1570	137,206	79,286	− 57,920	− 42
	1855	1922	166,229	112,719	− 53,510	− 32	1442	118,920	76,976	− 41,944	− 35

* *Montrose*, sailing vessel. Registered number, 25,023. † *Tallentire*, sailing vessel, 261 tons register, Registered number, 25,629; and *Alice of Nantes*, Foreign sailing vessel, 194 tons register.

APPENDIX (Continued.)

		IMPORTS.					EXPORTS.				
Name of Country.	Date.	No. of Vessels.	Register Tonnage.	Tons Weight of Cargo Carried.	Difference of Cargo, with reference to Tonnage.	Per Centage of Difference.	No. of Vessels.	Register Tonnage.	Tons Weight of Cargo Carried.	Difference of Cargo, with reference to Tonnage.	Per Centage of Difference.
HELIGOLAND	1852	1	173	19	— 154	— 89	1	53	...	...	...
	1843	1	30	...	...	...	2	64	...	...	...
	1854	...	...	...	...	...	1	36	24	— 12	— 33
	1855	10	2,113	...	...	...	7	1,554	1,310	— 244	— 15
GIBRALTAR	1852	41	13,594	411	— 13,183	— 97	213	39,197	28,808	— 10,389	— 26
	1853	63	18,223	2,150	— 16,073	— 88	280	49,606	42,711	— 6,895	— 13
	1854	66	20,456	1,220	— 19.236	— 94	342	59,624	56,465	— 3,159	— 5
	1855	87	27,425	1,859	— 25,566	— 93	445	82,885	97,139	+ 14,254	+ 17
MALTA	1852	82	12,727	14,908	+ 2,181	+ 17	225	56,813	56,218	— 595	— 1
	1853	54	9,873	12,566	+ 2,693	+ 27	344	87,013	92,727	+ 5,714	+ 6
	1854	119	32,822	7,481	— 25,341	— 77	678	199,067	168,505	— 30,562	— 19
	1855	122	41,609	3,741	— 37,868	— 90	696	228,918	265,525	+ 36,607	+ 16
IONIAN ISLANDS	1852	36	4,555	4,756	+ 201	+	61	13,494	14,047	+ 553	+ 4
	1853	48	6,985	7,343	+ 358	+ 5	71	16,819	17,873	+ 1,054	+ 6
	1854	33	4,999	4,685	— 314	— 6	72	17,741	21,459	+ 3.718	+ 21
	1855	25	4,359	3,043	— 1,316	— 30	42	13,775	17,825	+ 4,050	+ 29
NORTH AMERICAN PROVINCES	1852	2219	951,756	1,255,277	+303,521	+ 31	1351	522,870	247,897	—274,973	— 52
	1853	2324	1,002,990	1,330,933	+327,943	+ 32	1423	568,596	321,106	—247,490	— 43
	1854	2812	1,262,016	1,463,016	+201,000	+ 13	1579	657,828	398,877	—258,951	— 39
	1855	1567	795,023	1,049,354	+254,331	+ 31	861	391,704	197,196	—194,508	— 49
WEST INDIES AND HONDURAS	1852	896	255,263	264,699	+ 9,436	+ 3	797	232,055	160,300	— 71,755	— 30
	1853	733	194,406	217,716	+ 13,310	+ 6	657	180,350	139,376	— 40,974	— 22
	1854	905	255,057	277.938	+ 22,881	+ 9	795	230,490	163,694	— 66,796	— 28
	1855	736	222,329	247,049	+ 24,720	+ 11	654	204,118	149,018	— 55,100	— 27
FALKLAND ISLANDS	1852	1	817	...	...	...	5	1,060	180	— 880	— 83
	1853	2	562	181	— 381	— 67	4	1,468	1,150	— 318	— 21
	1854	3	699	651	— 48	— 7	3	380	896	+ 516	+135
	1855	...	...	...	...	...	...	...	403	...	...
AUSTRALIA & NEW ZEALAND.	1852	159	75,275	48,767	— 26,508	— 35	586	346,010	96,716	—249,284	— 72
	1853	177	103,611	39,147	— 64,464	— 62	1225	565,252	313,197	—252,055	— 44
	1854	177	118,132	39,667	— 78,465	— 64	884	538,192	268,655	—269,537	— 50
	1855	161	104,120	41,028	— 63,092	— 60	465	350,751	168,111	—182,640	— 52
EAST INDIES AND SINGAPORE	1852	499	294,824	304,472	+ 9,648	+ 3	430	249,627	178,790	— 70,837	— 28
	1853	549	347,336	339,293	— 8,043	— 2	455	276,621	221,041	— 55,580	— 20
	1854	577	356,247	348,034	— 8,213	— 2	481	292,934	226,476	— 66,458	— 22
	1855	637	431,178	437,874	+ 6,696	+ 1	719	510,171	370,532	—140,639	— 27
CEYLON	1852	50	21,015	20,979	— 36	—·17	69	28,780	26.625	— 2,155	—
	1853	54	20,994	22,139	+ 1,145	+ 5	66	27,216	27,113	— 103	—·37
	1854	73	31,522	31,218	— 304	— ·9	78	31,418	35,317	+ 3,899	+ 12
	1855	60	27,514	26,471	— 1,045	— 3	36	30,302	21,538	— 8,764	— 28
ADEN	1852	1	1,176	...	...	...	48	26,445	34,977	+ 8,532	+ 32
	1853	1	202	209	+ 7	+ 3	40	24,179	28,510	+ 4.331	+ 17
	1854	...	...	...	...	...	43	25,879	32,465	+ 6,586	+ 25
	1855	...	...	...	...	...	53	23,668	36,871	+ 13,203	+ 55
MAURITIUS	1852	138	44,708	56,215	+ 11.507	+ 25	42	17,214	11,815	— 5,399	— 31
	1853	140	49,745	62,919	+ 13,174	+ 26	57	23,905	23,998	+ 93	+·03
	1854	197	67,330	83,895	+ 16,565	+ 24	49	19,799	14,280	— 5,519	— 27
	1855	156	56,024	68,875	+ 12,851	+ 22	62	24,626	13,820	— 10,806	— 43
CAPE OF GOOD HOPE	1852	66	17,249	11,933	— 5,316	— 30	157	45,847	42,682	— 3,165	— 6
	1853	39	10,416	5,488	— 4,928	— 47	183	51,411	50,322	— 1,089	— 2
	1854	51	13,990	9,745	— 4,245	— 30	77	20,531	21,052	+ 521	+ 2
	1855	69	17,228	11,311	— 5,917	— 34	106	30,782	32,121	+ 1,339	+ 4
WEST COAST OF AFRICA	1852	77	20,423	13,416	— 7,007	— 34	80	20,258	12,140	— 8,118	— 40
	1852	72	23,559	10,905	— 12,654	— 53	83	25,995	12,938	— 13,057	— 50
	1854	53	15,114	10,986	— 4,128	— 27	58	15,195	11,498	— 3,697	— 24
	1855	50	13,953	12,341	— 1,612	— 11	71	18,870	14,980	— 3,890	— 20
ST. HELENA AND ASCENSION	1852	3	1,028	1,077	+ 49	+ 4	23	6,267	4,919	— 1,348	— 21
	1853	4	1,024	7	— 1,017	— 99	23	7,211	6,655	— 556	— 7
	1854	2	190	246	+ 56	+ 29	14	3,718	2,867	— 851	— 22
	1855	1	340	307	— 33	— 8	14	3,090	1,573	— 1,517	— 49
SETTLEMENTS OF HUDSON'S BAY COMPANY	1852	...	...	1,221	...	...	...	...	1,012	...	...
	1853	...	...	1,095	...	...	...	...	904	...	...
	1854	...	...	1,346	...	...	...	...	1,153	...	...
	1855	...	...	1,206	...	...	...	...	958	...	...

GENERAL SUMMARY.

	IMPORTS.					EXPORTS.				
Date.	No. of Vessels.	Register Tonnage.	Tons Weight of Cargo carried.	Difference of Cargo, with reference to Tonnage.	Per Cent. of Difference.	No. of Vessels.	Register Tonnage.	Tons Weight of Cargo carried.	Difference of Cargo, with reference to Tonnage.	Per Cent. of Difference.
1852	38,051	7,887,447	6,169,599	—1,717,848	—21	39,361	8,242,702	6,418,245	—1,824,457	—22
1853	42,876	8,943,106	7,525,063	—1,418,043	—15	44,779	9,447,104	7,316,457	—2,130,647	—22
1854	41,591	9,161,366	7,290,996	—1,870,370	—20	43,494	9,507,721	7,639,473	—1,868,248	—19
1855	40,980	8,951,239	6,254,259	—2,696,980	—30	42,597	9,538,231	8,370,363	—1,167,868	—12

HENRY WRIGHT.

11, Buckingham-street, London, W.C., June, 1858.

APPENDIX (CONTINUED.)

STATEMENT ABSTRACTED FROM A RETURN OF THE HOUSE OF COMMONS, SHOWING THE TOTAL NUMBER OF STEAM VESSELS REGISTERED IN THE UNITED KINGDOM ON OR BEFORE THE 1ST JANUARY, 1855, AND THE PER CENTAGE OF DEDUCTION FROM GROSS TONNAGE, ALLOWED FOR ENGINE ROOM, DISTINGUISHING WHETHER WOOD OR IRON PADDLE, AND WOOD OR IRON SCREW VESSELS.

No. of Iron Paddle Vessels.	Per Centage of Deduction from Gross Tonnage for Engine-room.
1	13
2	15
1	17
2	18
1	20
5	22
1	23
4	24
4	25
5	26
5	27
7	28
6	29
23	30
8	31
12	32
9	33
13	34
15	35
15	36
9	37
8	38
12	39
13	40
12	41
7	42
5	43
10	44
8	45
6	46
5	47
4	48
7	49
5	50
1	51
1	53
1	54
1	55
2	56
2	57
1	58
2	59
1	60
3	63
1	65
1	68
1	69
1	72
1	74
1	75
1	81
1	82
1	92
TOTAL—274	

No. of Iron Screw Vessels.	Per Centage of Deduction from Gross Tonnage for Engine-room.
1	5
1	7
1	9
1	10
1	11
2	15
4	16
3	17
10	19
6	20
5	21
14	22
8	23
17	24
13	25
11	26
18	27
12	28
19	29
12	30
7	31
13	32
12	33
3	34
4	35
5	36
3	37
6	38
7	39
6	40
9	41
4	42
1	43
1	45
6	46
2	47
2	48
2	49
4	50
1	51
2	52
1	55
1	57
1	60
1	63
1	74
264	

No. of Wooden Paddle Vessels.	Per Centage of Deduction from Gross Tonnage for Engine-room.
1	12
1	15
1	17
2	19
2	20
1	21
1	22
5	23
5	25
6	26
4	27
8	28
8	29
24	30
13	31
18	32
26	33
23	34
23	35
17	36
28	37
20	38
18	39
37	40
21	41
14	42
23	43
20	44
10	45
18	46
10	47
7	48
3	49
18	50
8	51
10	52
5	53
12	54
6	55
18	56
11	57
12	58
15	59
18	60
13	61
15	62
20	63
17	64
24	65
26	66
19	67
17	68
40	69
742	

No. of Wooden Paddle Vessels. (*Continued.*)	Per Centage of Deduction from Gross Tonnage for Engine-room.
742	
31	70
18	71
19	72
16	73
14	74
7	75
10	76
2	77
2	78
2	79
1	80
1	81
2	82
1	85
1	88
2	89
871	
60*	
931	

No. of Wooden Screw Vessels.	Per Centage of Deduction from Gross Tonnage for Engine-room.
1	22
1	24
1	25
1	26
2	29
1	30
1	35
1	38
1	54
10	

SUMMARY OF TABLE.

Iron Paddle Vessels............	274
Iron Screw Vessels	264
Wooden Paddle Vessels......	931
Wooden Screw Vessels	10
Wood and Iron Paddle (with 26 per cent. deduction from gross tonnage for engine-room)	1
Total.................	1480

HENRY WRIGHT.

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* The full data are not given to enable the calculations to be made, in the case of these 60 wooden-paddle vessels.

THE CAMPANA COLLECTION.

The following is extracted from the *Times*:—

Letters from Rome speak of the intended sale of the extremely remarkable collection[*] of antiquities and works of art belonging to the Marquis Campana, a collection with which most English visitors to the Eternal City are probably acquainted. It is estimated to have cost 6,000,000f., or £240,000, and assuredly the instances must be very rare of one of a similar extent having been made by a private individual. It fills a vast number of rooms, in three or four different houses. Various suggestions have been made as to the manner in which it should be disposed of; one, among others, being that it should be purchased *en bloc* by the Sardinian Government, as the nucleus (and truly a very considerable one) of a public museum in that country, at present wanting. It is unlikely, however, that the Government would propose, or the Chambers vote, the large grant that would certainly be needed for its acquisition. We have been promised that there shall be no more loans, and the budget is already sufficiently burdened with the expenses of public works greatly needed, and of fortifications deemed equally necessary. Unless, however, some Government buys it in a lump it will doubtless be dispersed, for no individual is likely to make such an enormous purchase. There have been many reports as to what would be done with it, and an auction has been talked of, but nothing seems at present decided, although something probably soon will be, and I believe it is certain that the administrator of the estate is at present open to offers. The collection may be broadly divided into 12 classes, some of which are exceedingly rich and valuable, others less worthy of note. Among the latter must be classed the paintings, although these comprise some remarkable works, including the frescoes from Raphael's two villas on the Palatine and Pincian hills, and although many of the others will be highly interesting to amateurs of the pre-Raphaelite period. The pictures are about 650 in number. Among the most precious portion of the collection must be classed the Etruscan vases, nearly 3,800, divided into 15 series. It is said to be the finest collection of this kind in existence; indeed, in Etruscan art generally the Campana museum is considered unrivalled. The great number of the objects strikes all visitors with surprise. One most elegant vase, beautifully preserved, adorned with delicate relievos of figures, foliage, and animals, with gildings and bright colours, has been preferred by some antiquaries to the Portland vase. A very large sum was given for it by its enterprising owner. The collection of gold ornaments, jewellery, and bronzes is as remarkable as that of the vases, and the same may be said of the terra cottas, and little less of the very interesting class of glass and enamels. There are some beautiful ancient arms, among which two ancient casques (Etruscan), wreathed with golden leaves of laurel and ivy, and perfectly preserved, strike the eye and attract general admiration. There is another helmet, of solid silver, partially but admirably chased. The collection of sculpture comprises several hundred busts and statues, many of great merit and some celebrated. The gems, cameos, and numismatic collection are all in a number and importance rarely found in private cabinets. I do not enumerate all the classes, still less attempt to speak of their subdivisions or venture upon criticism of individual objects, although I recently went over the greater part of the collection, and was fortunate enough to do so in company with one of our most approved English connoisseurs. But the most incompetent appreciator of art and antiquities cannot but be struck with admiration of the great beauty of the collection, and by the rarity and curiosity of the relics—most of them very well preserved—which are there displayed. As to the extent, some of the numbers above cited will help to form an idea of it. The terra cottas and objects of plastic art are nearly 2,000 strong, and reputed without a rival as a collection. There is a whole suite of rooms full of majolica. In the way of art and antiquities, Rome is such an inexhaustible museum, such a labyrinth of wonders, that collections which would make the reputation of other cities may there be almost lost in the crowd. Even in Rome, however, the Campana Museum will hardly be omitted from the list of persons who have but a short time to devote to the treasures of the Papal capital, and it should the less be neglected since there is a great probability of its being soon broken up and scattered abroad.

MANUFACTURE OF CLOTHING BY MACHINERY.

In evidence recently given before the Army Contracts' Commission, Mr. Peter Tait, of Limerick, said that the whole of his clothing was cut and sewn by machinery driven by steam, and capable of making 4,000 suits a-week. It was owing to the encouragement he had received from Sir Thomas Troubridge, at the War office, that he had carried the practical application of machinery so far. He could now clothe the whole of the British army, assuming that 250,000 suits would be required annually; and, on an emergency, with the steam power at his command, he could furnish 100,000 suits a-week to the Government. He employed about 1,100 people, and no man at wages lower than a guinea a-week.

Home Correspondence.

THE SHIPS OF THE ROYAL NAVY.

SIR,—The letters of Sir John Rennie and Mr. MacGregor, in the last number of your *Journal*, require a line or two from me.

I have been fortunate in eliciting from Sir John a statement of the very interesting facts recorded by him. Now that he has made them public, they will, I doubt not, be duly considered by future writers on the Navy. But my omission of them is no evidence of neglect. Even if my time and space had permitted their introduction into my paper, I could scarely have narrated them; for, notwithstanding some considerable research, they were unknown to me until the proof-sheets of the paper were corrected, and I was on the point of addressing your Society. The work on which I chiefly relied respecting the earliest actual introduction of steam into the Royal Navy, is the autobiography of Sir John Barrow, who had excellent opportunities of learning much about it, and few inducements, I should think, to exaggerate what he knew. According to him, "the ingenious Brunel" took up the question of the propulsion of ships of war by steam, made experiments on the subject early in 1816, and wrote an encouraging letter upon the results to Lord Melville. These statements, while they neither clash with Sir John Rennie's, nor diminish the honour due to him and his eminent kinsmen, indicate that the future historian will have to scrutinize the claims of more than one of our greatest engineers somewhat closely, before he discovers all the truth of the matter. I regret that I cannot agree with Sir John on one point. I cannot see how the towing of the *Hastings* by a Margate steamer "may fairly be considered the first introduction of steam into the Royal Navy."

There is a remark in Mr. MacGregor's letter which is, at least, susceptible of an interpretation adverse—unfairly so, I think—to myself. He says, "it is extraordinary that men will continue to compare the tonnage of vessels, as if a proper standard were actually in use, when it is generally acknowledged that the engine-power and tonnage capacity are both estimated by a calculation wholly illusory." This seems to me to imply either that I (of whose paper he is writing) compared tonnages improperly, or that the rules for calculating tonnage are so "wholly illusory" that tonnages necessarily mislead, whenever and however compared. I can admit neither of these implications. In the first place, I made no comparison of tonnages, except in the case of the *Shannon* and *Merrimac*, and even in that case I simply quoted Captain Dahlgren's admission—to the effect that the latter vessel is of greater tonnage than the former—and accepted it, in order to account for the inferiority of the *Shannon's* armament. I was aware that Captain Dahlgren's estimate was not literally correct, for the difference between the tonnages of the two ships (when both are calculated by the English rule) is much greater than he represented, the *Shannon* being of 2651, and the *Merrimac* of 3500; but for the purpose of my argument his admission was ample, and I therefore contented myself with accepting it. It will be seen from this that in my only comparison of tonnages I was most careful to avoid error—more careful, probably, than Mr. MacGregor supposed me. In the second place, it cannot for a moment be admitted that, with the relative tonnages given above, the *Shannon* may yet be as large a ship as the *Merrimac*. It would be pushing the defects of the existing rules much too far to suppose that.

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[*] A catalogue of the Collection has been presented to the Society's Library.

Apart from its application to myself, I cannot assent to Mr. MacGregor's proposition, that "it is extraordinary that men will continue to compare the tonnages of vessels." They must, for general purposes, compare tonnages (calculated by the same rule, of course), or else give up comparing vessels altogether; for they have at present, at least, no better basis of comparison. In saying this, I am not implying that the rules for calculating tonnage are either perfect or satisfactory; they are neither. But they are better than none, and better than any other existing and recognised means of comparing the sizes of vessels.

As for myself, I avoided, in my paper, all use and mention of these rules. Their improvement is a subject I was not called upon to discuss; and a subject, moreover, which has lately had such a mountain of big, rugged, and ponderous words heaped upon it, that I felt no inclination to voluntarily attempt its exhumation before the eyes of the learned, and, as I found, very generous members of your Society. I am, &c.,

E. J. REED.

Mechanics' Magazine Office, 166, Fleet-street,
London, Jan. 5, 1859.

Proceedings of Institutions.

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HITCHIN MECHANICS' INSTITUTION.—The last report of the Institution speaks favourably of its prosperity. The library has, during the past year, been more extensively used than in any previous year; the number of entries in the librarian's book has been steadily increasing year by year since 1853, when 1385 volumes were taken out—this year 3,469 volumes have been entered by members for perusal, averaging 289 books per month. The books read during the past year have been of the following classes:—48 on theology; 484 on arts, sciences, and philosophy; 551 on voyages and travels; 443 on history; 556 on biography; 383 on fiction; 77 on poetry and the drama; 927 on miscellaneous literature. The committee, consequently, feel encouraged in their efforts to enlarge the library, especially in those classes of books which are most frequently read by the members; and they express their satisfaction that the books which have the largest circulation are of the most useful and instructive character. During the year, seventy-three volumes have been purchased by the committe, at a cost of £17 11s. 11d. The library has also been increased by two valuable presents of books. Sixteen lectures, on various subjects, have been delivered during the season—the expenses attendant upon which have amounted to £51 19s. 9d., and the receipts for admission have amounted to £54 14s., leaving a profit of £2 14s. 3d. On comparing this with previous years, the sum will appear a very small one, and this arises from the great reduction in the charges for admission. The new scale, admitting the families of members at half-price, has the effect of reducing by about one-half the amount received at each lecture; had this rule not existed, judging from previous years, there would most probably have been a profit of £20. The committee direct particular attention in their report to the advantages offered to members from the connexion of the Institution with the Society of Arts, especially with regard to the examinations. The treasurer's report shows an income of £139 9s. 10d., and an expenditure of £131 5s. 5d.; the Institution remains entirely free from debt, and has a clear balance of £8 4s. 5d. in hand.

MEETINGS FOR THE ENSUING WEEK.

MON. ......London Inst., 7. Prof. Huxley, "On Biology."
British Architects, 8.
Medical, 8.
Geographical (Burlington House), 8½. I. "Notes on the Zambesi Expedition from the Journal of Thomas Baines, Esq." Communicated by Dr. Livingstone. II. Mr. E. G. Squier, "An Account of the Lake Tojoa or Toulebé in Honduras or Central America." III. "Journal of a Voyage in Mexico by Mr. Charles Sevin."
TUES. ......Syro-Egyptian, 7½. Messrs. Sharp and Bonomi, and Dr. Camps, "On the triple mummy case of Aroerido, an Egyptian Priest."
Civil Engineers, 8. Discussion on Mr. Scott's Paper, "On a Breakwater at the Port of Blyth," &c.
Med. and Chirurg., 8.
Zoological, 9.
WED. ......London Inst., 3. Mr. T. Rymer Jones, "On the Natural History of the Vertebrate Division of the Animal Kingdom."
Literary Fund, 3.
Graphic, 8.
Archæological Assoc., 8½.
THURS. ...Royal Society Club, 6.
London Inst., 7. Mr. George MacDonald, "On the Poetry of the 16th Century."
Antiquaries, 8.
Philological, 8.
Royal, 8½.
FRI.........Astronomical, 8.
SAT. ......London Inst., 3. Mr. T. A. Malone, "On the Metallic Elements and their Principal Salts and Alloys."

PATENT LAW AMENDMENT ACT.

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APPLICATIONS FOR PATENTS AND PROTECTION ALLOWED.

[*From Gazette, December* 31, 1858.]

Dated 6th December, 1858.

2788. J. G. Arnold, Worcester, Massachusetts, U.S.—Imp. in envelopes for letters and similar purposes.
2790. J. Muir, Glasgow, and F. Muir, Paisley—Imp. in ornamental or colour printing.
2792. J. Dawson, Holbeck, Leeds—Imp. in machinery or apparatus for raising the nap on woollen cloths.
2794. R. A. Brooman, 166, Fleet-street—Imp. in the manufacture of gloves. (A com.)
2796. E. W. Scale, Merthyr Tydvil, Glamorganshire—Imp. in railway and other breaks.

Dated 7th December, 1858.

2798. W. A. Gilbee, 4, South-street, Finsbury—An improved portable bath. (A com.)
2800. J. Whiteley and T. Kitchenman, Halifax—Imp. in press plates or apparatus employed in hot pressing woven fabrics.
2802. J. J. Harris, Woodlesford, near Leeds—Imp. in apparatus for refrigerating and regulating the temperature in worts and beer, which may also be employed as condensers in distilling.
2806. W. Burness, 2, Prospect-terrace, Brixton—Imp. in pumping and forcing liquids.
2808. J. Ferrabee, Phœnix Iron Works, and F. H. England, Foomhall Mills, Stroud—Imp. applicable to machinery for carding, scribbling, and condensing wool and other fibrous substances.

Dated 8th December, 1858.

2810. G. F. Chantrell, Liverpool—Imp. in apparatus applicable to the manufacture and revivification of animal or vegetable charcoal.

2812. R. L. P. Manning, Princes-square, Middlesex—A floating paddle wheel.
2814. S. Phillips, Moseley, near Birmingham—Imp. in sliding window sashes, shutters, and doors.
2816. W. King, jun., Guildford—Imp. in apparatus for roasting coffee and other substances.
2818. H. Meidinger, University of Heidelberg, Germany—Imp. in electric batteries.

Dated 9*th December*, 1858.

2820. J. Barrow, junr., Manchester—Imp. in the treatment of coal gas tar, and of the oils obtained by the distillation of the same, and for the application of substances obtained thereby.
2822. J. Eccles, Blackburn—Imp. in arrangements and machinery for preparing for manufacture and for manufacturing clay and other plastic earths into bricks, tiles, pipes, and other articles formed of such materials.
2824. J. Little, Glasgow—Imp. in fire grates and heating apparatus.
2826. J. Stewart, 69, Tottenham-court-road—Imp. in the construction of the action of pianofortes.
2828. J. Wilson, Wansford, Northamptonshire—Imp. in machinery for tilling and cultivating land.

Dated 10*th December*, 1858.

2834. J. Flockton, junr., Manchester—Imp. in stop or reversing taps.
2836. A. Barclay, Kilmarnock, N.B.—Imp. in obtaining motive power by means of electricity, magnetism, and electro magnetism.
2838. W. Beardmore, Deptford—Imp. in steam boilers.
2840. G. W. B. Kiallmark, Bridgewater, and W. T. Timewell, North Wharf-road, Paddington—Imp. in the manufacture of cements.

Dated 11*th December*, 1858.

2842. J. B. Guthrie, Manchester—Imp. in the manufacture of india-rubber overshoes.
2844. J. Hinks, Birmingham—Imp. in ships' and other lamps.
2846. C. J. Richardson, 34, Kensington-square—Imp. in apparatus to be applied to chimneys or flues of buildings, for economizing heat and reducing the quantity of smoke passing into the atmosphere.
2848. W. E. Wiley, 34, Great Hampton-street, Birmingham—Imp. in ever-pointed pencils.

Dated 13*th December*, 1858.

2850. J. A. Carruthers and T. Blackburn, Blackburn, Lancashire—Imp. in apparatus for guiding and regulating the warp threads in the operations of warping tape-sizing, looming and weaving.
2851. R. Whittam, Accrington—Imp. in machinery, or apparatus, for tracing designs from an engraved roller, or from an engraver's sketch upon steel or other metallic surfaces, used as dies by engravers to calico printers.
2852. L. C. V. Yon, Lisieux, France—Improved elastic beds.
2853. J. M. Roussel, 8, Impasse des Couronnes, Belleville, near Paris—A new system and new apparatus, using air as a motive power.
2854. J. E. Boyd, Hither-green, Lewisham—Imp. in candlesticks, lamps, and lanthorns.
2855. R. A. Brooman, 166, Fleet-street—Imp. in twisting and otherwise operating upon threads, twine, or cords, and in apparatus for performing the same. (A com.)
2856. R. A. Brooman, 166, Fleet-street—Imp. in the manufacture of cranked axles and shafts. (A com.)
2857. E. Loomes, Whittlesea, Cambridgeshire—An imp. in the construction of steam engines.
2858. J. Ferrabee, Phœnix Iron Works, Stroud—Imp. in the construction of steam engines, and in the mode of working the same.

Dated 14*th December*, 1858.

2859. J. Webster, Birmingham—A new or improved method of recovering copper and zinc from liquids which have been employed to dip or pickle articles made of brass or other alloys containing copper and zinc.
2860. E. Bow, Port Dundas, Lanark, N.B.—Imp. in pumps.
2861. D. Anderson, Glasgow—Imp. in taps or valves.
2862. J. Wade, Bradford—Imp. in means or apparatus employed in weaving.
2863. G. W. Baker, Park Farm, Woburn, Bedfordshire—An improved construction of manger fastening.
2864. R. A. Brooman, 166, Fleet-street—An imp. in transmitting electric telegraph signals.
2865. J. T. Smets, Plaçamen, France—A method of making vinegar from a refuse product obtained in the manufacture of starch.
2866. F. Jossa, Bishop Auckland, Durham—Imp. in furnaces for generating steam and other purposes.

Dated 15*th Deeember*, 1858.

2867. J. Pendlebury, Crumpsall, Lancashire—Certain imp. in machinery or apparatus for bleaching or cleansing textile fabrics or materials.
2868. D. Rowan, Greenock—Imp. in steam engines.
2869. H. Bridges, Bridgwater—Imp. in the means of working breaks on carriages on railways.
2870. F. C. N. J. V. Migeon, Morvillars, France—Imp. in manufacturing screws, rivets, nails, spikes, and all similar articles made of metallic wire, and in the machines connected therewith.
2871. A. V. Newton, 66, Chancery-lane—Improved machinery for manufacturing bullets. (A com.)
2872. A. V. Newtou, 66, Chancery-lane—An improved arrangement of condensing apparatus. (A com.)
2873. J. Bullouga, Blackburn—Imp. in looms.
2874. C. F. Vasserot, 45, Essex-street, Strand—An improved pendulum governor for regulating the supply of steam to the cylinders of marine engines. (A com.)
2875. W. Clark, 53, Chancery-lane—Improved agricultural implements.
2876. J. Wardill, Commercial-road East—An improved stopper or controller, to stop and control the running out of chains and ropes.
2877. G. Bell, Wandsworth—An imp. in matches and fusees.
2878. T. Moss, Gainsford-street, Islington—Imp. in printing bank-notes, bills of exchange, and other documents requiring like security against being copied.
2879. W. Morgan, Witton-park Iron Works, near Darlington, Durham—Imp. in the manufacture of iron.

Dated 16*th December*, 1858.

2881. W. H. Carmont, 2, Rosamond-place, Upper Brook-street, and W. Corbett, 22, Blantyre-street, Chester-road, Manchester—An improved mode of constructing furnaces for the production of wrought iron and steel, and manufacturing such metals into ingots and other forms.
2882. A. Stokes and F. J. Stokes, Birmingham—New or improved machinery for the manufacture of screws.
2883. R. Mushet, Coleford, Gloucestershire—A new or improved manufacture of cast steel.
2885. J. W. Edge, Manchester—A certain imp. in balls, bullets, or other projectiles to be employed in fire-arms or ordnance.
2886. J. W. Friend, Freemantle, Southampton—Improved apparatus for ascertaining and registering the depth and flow of liquids, and the distances run by ships at sea.
2887. A. Mackenzie, Glasgow—Imp. in sewing machines.
2888. J. J. Marçais, Paris—Imp. in galvanic batteries.
2889. W. White and J. Parlby, Great Marylebone-street—Imp. in the preparation or treatment of "carton pierre," and such like composition, and in the application thereof to the coating or covering of walls and other surfaces.
2890. R. A. Brooman, 166, Fleet-street—An imp. in plating and gilding forks, spoons, and other metal articles. (A com.)
2891. W. Clark, 53, Chancery-lane—Imp. in submarine electric telegraph cables or conductors. (A com.)

Dated 17*th December*, 1858.

2892. J. J. Aston, 41, Doughty-street, Middlesex—Imp. in machinery or propellers applicable for the propulsion of ships' boats and other vessels on and through the water, and in the propelling of all such vessels on and through the water by means of such propellers.
2893. W. B. Johnson, Manchester—Imp. in machinery or apparatus for preparing for joining the rails of railways.
2894. J. Inshaw and J. Inshaw, Birmingham—An imp. or imps. in locomotive engines.
2895. A. Hinde, Wolverhampton—Imp. in treating or preparing the cinder or slag from puddling furnaces for the purpose of facilitating the manufacture of iron therefrom.
2896. J. Kerr, 17, Bedford-terrace, Trinity-square, Southwark—Imp. in the construction of revolving fire-arms.
2897. J. Clegg, Keighley, Yorkshire—Imp. in lubricating the valves and pistons of steam engines.

Dated 18*th December*, 1858.

2899. J. Aitken and J. Brooks, Irwell Vale Mill, Edenfield, near Bury—Imp. in looms.
2901. A. Mitchell, Glasgow—Improved apparatus for registering the speed of engines and other machinery.
2903. A. P. How, Mark-lane—Imp. in cocks or stop valves.
2905. J. Soutter, Edinburgh—Imp. in apparatus for drying or airing linen or other articles of wearing apparel.

Dated 20*th December*, 1858.

2907. T. S. Woodcock, Salford—An improved index or book and paper marker.
2909. R. Maclehose, Ayr, N.B.—Imp. in stereoscopes.
2911. A. V. Newton, Chancery-lane—An imp. in lanterns. (A com.)

WEEKLY LIST OF PATENTS SEALED.

[*From Gazette*, *Dec.* 31, 1858.]

December 31*st*.

1476. T. Whiteley.
1479. T. Blinkhorn.
1480. T. Riddell.
1487. P. R. Hodge & G. Spencer.
1492. D. Le Souef.
1493. T. Scott.
1494. J. Billing.
1497. T. Restell.
1498. W. Bond and T. Standing.
1500. J. G. Jennings & T. Culpin.
1502. J. G. Jennings.
1504. J. G. Jennings and J. Lovegrove.
1505. E. Haeffely.
1507. R. A. Brooman.
1516. W. E. Newton.
1536. P. R. Hodge.
1555. W. Langshaw.
1633. J. Shand.
1661. R. P. Walker.
1921. H. B. Barlow.
1929. R. A. Brooman.
2103. J. H. Gresham.
2255. A. Miller.

PATENTS ON WHICH THE STAMP DUTY OF £50 HAS BEEN PAID.

[*From Gazette*, *Dec.* 31, 1858.]

December 28*th*.

2938. G. Chisholm.
50. C. A. Hanson & J. Wormald.

December 29*th*.

2949. S. Lees, E. Lees, and G. H. Newton.
36. E. H. Bentall.
87. W. Smith.

[*From Gazette*, *Jan.* 4, 1859.]

December 30*th*.

5. W. B. Johnson.
25. C. Mather & C. Millward.
27. J. Fowler, jun.

December 31*st*.

2952. Sir J. S. Lillie.

January 1*st*, 1859.

136. J. Schloss.